A NOTE ABOUT THE SAMPLE ACTIVITIES

The following are sample activities, designed to show you examples of possible activities for each API. You are not required to use these specific activities in your portfolios. The APIs used in this document come from the column for grades 9-12 in the TCAP-Alt Performance Indicators document, which is available on the Tennessee State Department of Education website. The URL is: http://www.state.tn.us/education/speced/seassessment.shtml.

The grade level 9-12 column was chosen because it includes (with only minor differences) the APIs from the other columns. If you use any of the following activities in your classroom and represent them in your own portfolios, be sure to use the API from the column that corresponds to the student's whose portfolio you are preparing.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.1 *The student will understand numbers, ways of representing numbers, relationships among numbers, and number systems.*

Alternate Performance Indicator (API): NO.1.1 *Count how many objects are in a set (1-100)*

Sample Activities:

- Given a box of twenty-five 1-inch rubber balls, the student will pick up one ball and drop it into a coffee can each time the teacher says, "Put one ball in the can."
- With hand-over-hand assistance, the student will touch each cotton ball in a row of five cotton balls as the teacher counts them.
- Given three wooden blocks, the student will drop the blocks, one at a time, into a pail. The teacher will count the blocks as the student drops them.
- The student will be given ten marbles and a jar. As the teacher counts from 1-10, the student will drop one marble into a jar each time a number is spoken.
- The student will count how many objects are in a set (1-5) using teddy bear counters. The student will be given a number of bears and will count them in sign language.
- In preparation for painting a mural, the student will count the number of peers at his/her table, give each peer a paint brush, and tell how many brushes were given.
- Given a peg board and a number of colored pegs, the student will count the number of pegs of each color (example: 3 blue pegs, 5 red pegs, 2 yellow pegs, etc.).
- Given 15 Nerf balls, the student will count the balls and place them in a basket.
- Given a plastic bag and 48 plastic cups for a Hands-On Science kit, the student will count the cups and place them in the plastic bag.

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Alternate Learning Expectation (ALE): NO.1 *The student will understand numbers, ways of representing numbers, relationships among numbers, and number systems.*

Alternate Performance Indicator (API): NO.1.2 *Count to 100 by 1's, 5's, and 10's*

Sample Activities:

- The student will turn his or her head toward a group of peers singing the song "Five Little Monkeys."
- The student will sing along with the song "Five Little Monkeys."
- The student will step on a plastic disc that makes a ball go up into the air. The student will count the number of balls sent into the air.
- After listening to *The Counting Book*, the student will count by rote to 10 by 1s.
- Upon request, the student will verbally count to 30 by ones with no adult assistance.
- The student will play "Mother-May-I," counting the correct number of steps as directed each turn. (Example: "Take three giant steps forward ," "Take three scissor steps forward," "Take two baby steps backward.")
- Given a box of 100 paper clips, the student will place the clips into groups of ten and use the groups to count to 100 by 10s.
- During a game of hide-and-seek," the student will count to 100 when it is his or her turn to be "IT."
- While a peer does jumping jacks, the student will count how many jumping jacks are done.
- The student will play a jump rope game with peers, counting how many jumps each child makes before "missing."
- Given 50 to 100 pennies (always a number divisible by 5), the student will organize the pennies into sets of five, then use the groupings to count by 5s to find the total number of pennies.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.1 *The student will understand numbers, ways of representing numbers, relationships among numbers, and number systems.*

Alternate Performance Indicator (API): NO.1.3 *Identify equivalent sets of objects by one-to one correspondence (1-100)*

Sample Activities:

- Given a bag of miniature marshmallows and a set of number cards, each printed with a number from 1-10 and an equivalent number of dots, the student will place a marshmallow on each dot to create a set equivalent to the number on the card.
- Given a set of 1-5 plastic animals and shown a card with a number (1-5) written on it, the student will answer "yes" or "no" when asked if the number on the card matches the number of animals in the set.
- Given two sets of plastic animals, the student will indicate whether the two sets are have the same number of animals (thumbs up) or a different number (thumbs down).
- Given a pegboard and 10 colored pegs and shown a second pegboard with 1-10 pegs already placed in the board, the student will place the same number of pegs in his or her pegboard.
- Given modeling clay and shown sets of 1-10 clay balls, the student will make a number of clay balls equal to the number contained in each set.
- The student will be given a bag of M&Ms and an egg carton with a number from 1-12 written in the bottom of each individual egg cup. The student will place the correct number of M&Ms into each cup, so that the number written in the cup is equal to the number of M&Ms in that cup.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.1 *The student will understand numbers, ways of representing numbers, relationships among numbers, and number systems.*

Alternate Performance Indicator (API): NO.1.4 *Identify numerals 0-100*

Sample Activities:

- The student will watch the Sesame Street video *Learning About Numbers*.
- When given two number cards (1 and 2), the student will point to the one named by the teacher.
- The student will be given number cards 1-5. As the song "Five Little Monkeys" is played, the student will hold up the number card that corresponds to the number of monkeys in each verse.
- Given a walk-on number line, the student will hop, jump, or step from the beginning edge of the line to the number requested.
- The student will make numbers 1-10 from modeling clay.
- The student will trace sandpaper numbers with a finger and repeat the name of the number after the teacher.
- When number cards 0-50 are held in front of the student, the student will verbally identify the number on the card.
- Given twenty-five laminated cards, each printed with a number between 1 and 100, the student will use a dry-erase marker to draw a number of dots on the back of the card equal to the number written on the front of the card.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.1 *The student will understand numbers, ways of representing numbers, relationships among numbers, and number systems.*

Alternate Performance Indicator (API): NO.1.5 *Identify and name coins (penny, nickel, dime, and quarter)*

Sample Activities:

- Given real coins and a card with a series of five realistically-represented coins printed on it, the student will match real coins to those on the card by placing real coins on top of their printed counterpart.
- Given a penny and a quarter, the student will point to the penny on request.
- Given realistic-looking plastic coins (penny, nickel, dime, and quarter) and asked to identify one (example: "Show me the dime"), the student will point to the correct coin.
- While a peer holds a handful of various coins, the student will pick out 5 dimes from the mixed change to purchase a brownie from the school bake sale.
- The student will play Money Bingo with three other peers.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.1 *The student will understand numbers, ways of representing numbers, relationships among numbers, and number systems.*

Alternate Performance Indicator (API): NO.1.6 *Count pennies, nickels, dimes or quarters with values up to $10.00*

Sample Activities:

- Given 10 pennies, the student will count them orally by 1s.
- Given 20 nickels, the student will determine their value by counting orally by 5s (i.e., touch the first nickel and say "five," touch the second nickel and say "ten," etc.).
- The student will play a money-changing game in which the object is to accrue pennies (by answering simple questions correctly at a rate of a penny per answer) and "trade up" by exchanging five pennies for a nickel, ten pennies or two nickels for a dime, etc.
- The student will use dimes and quarters to buy two items from the snack machine with exact change.
- The student will go to the school bookstore and purchase an item of choice that costs less than $1.00. The student will count out the correct amount of money and pay the cashier.
- Given real coins and a Money Bingo file folder, the student will match the coins to the pictures on the Bingo game card.
- When provided with plastic pennies, nickels, and dimes, the student will verbally identify each coin, state the value of each coin, and count out a value equal to $1.00.
- Given real coins and a card picturing the coins required to buy a soft drink from the vending machine, the student will place the appropriate coins on their pictured counterparts to determine how much change is needed, then use the change to purchase a soft drink from the machine.
- With the help of a peer, the student will use real coins to count out the exact change to buy a pencil and a writing tablet from the school bookstore.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.1 *The student will understand numbers, ways of representing numbers, relationships among numbers, and number systems.*

Alternate Performance Indicator (API): NO.1.7 *Order numbers less than 100*

Sample Activities:

- Given number cards (1 and 2), the student will place the number cards in numerical order.
- Given two-inch metal train cars, each marked with a number from 1-10, the student will place the cars in numerical order. When the train has been correctly assembled, the student may "drive" it on a plastic track.
- Given a wooden inset puzzle with slots for the numbers 1-10 in order, the student will correctly assemble the puzzle by placing each number in its proper place.
- Given birthday candles in the shape of numbers, the student will place the candles in order from 1 to 10. When the student chooses the correct number, the teacher will light the candle and allow the student to blow it out.
- When shown three 3x5 cards, each with a number between 1 and 50 written on it, the student will tell indicate (by pointing) which number comes first, next, and last.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.1 *The student will understand numbers, ways of representing numbers, relationships among numbers, and number systems.*

Alternate Performance Indicator (API): NO.1.8 *Use concrete objects to develop strategies for addition or subtraction of whole numbers to 100*

Sample Activities:

- The student will use a walk-on number line to perform simple addition and subtraction problems (i.e., for 3 + 2. the student would start on the number three and take two steps forward; for 5-1, the student would start on the number 5 and take one step back).
- Given ten 1-digit addition problems, the student will work the problems using 1" wooden blocks as counters.
- The student will roll two game cubes and count the dots on each cube. Then the student will say or write an addition sentence and solve through computation or counting the total number of dots.
- Given Touchpoint cards for the numbers 1-3, the student will say each number and count the corresponding points.
- The student will use an abacus to correctly complete ten 2-digit addition and subtraction problems without regrouping.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.1 *The student will understand numbers, ways of representing numbers, relationships among numbers, and number systems.*

Alternate Performance Indicator (API): NO.1.9 *Represent whole numbers to 100 with models*

Sample Activities:

- After being presented with a visual representation of the number "3," the student will draw 3s in shaving cream.
- The student will practice writing the number "5" in a salt tray.
- The student will make the numbers 1-4 from modeling clay.
- Given a set of ten Popsicle sticks and asked to show a specific number of sticks no less than 1 and no more than 10, the student will pick up a number of sticks equal to the number requested.
- After reading the book *Ten Apples Up On Top* by Dr. Seuss, the student will practice balancing 1-10 beanbags on his/her head. Next, the student will make will make a self-portrait from a paper plate using buttons, wiggly eyes, and construction paper shapes for facial features and yarn or fake fur for hair. The paper plate portrait will be glued to a larger piece of poster board. The student will then use half an apple and tempera paint (red, green, or yellow) to make apple prints of 1-10 apples "balanced" on the portrait's head. The student will then count the number of apples on the self-portrait's head. (Idea from Jessica Barrett: http://www.lessonplanspage.com/LAArtMathPEMDTenApplesUpOnTopK2.htm.)

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.1 *The student will understand numbers, ways of representing numbers, relationships among numbers, and number systems.*

Alternate Performance Indicator (API): NO.1.10 *Read and write numbers to 100*

Sample Activities:

- On a sheet of tablet paper, the student will trace a dotted numeral "4" with a highlighter.
- Given a tray filled with sand, the student will use one finger to write the number "3" in the sand.
- The student will play a board game in which a number card from 1-6 is drawn to determine the number of spaces to be moved.
- Given a set of ten Popsicle sticks and shown a numeral from 1 to 10, the student will pick up a number of sticks equal to the number shown.
- Given a folder game with ten pockets, each with a number from 1 to 10, and ten cards, each with a set of 1-10 items pictured on it, the student will place each card into its corresponding pocket.
- The student and a peer will take turns calling out numbers from 1-100. One student will call out a number, and the other student will write the number on a lap-sized chalkboard. Then the positions will be reversed. After ten "calls," the student who has correctly written the most numbers wins the set. Each pair of students will play four sets.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.1 *The student will understand numbers, ways of representing numbers, relationships among numbers, and number systems.*

Alternate Performance Indicator (API): NO.1.11 *Order whole numbers up to 100 indicating more than, less than, or equal to*

Sample Activities:

- When shown two number cards, the student will show "thumbs up" if the numbers on the card are the same and "thumbs down" if they are different.
- The student will write the names of six friends and circle the one that has the most letters.
- Given two number cards, the student will tell which number is more.
- Given two number cards, the student will tell which number is less.
- Given a clothesline, ten "pinch clothespins," and five cardboard shirts numbered 1-5, the student will clip the shirts to the clothesline in numerical order.
- Given ten "pinch clothespins" and a set of ten poster-board blackbirds numbered 1-20, the student will clip the blackbirds in numerical order to a cardboard tree branch.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.1 *The student will understand numbers, ways of representing numbers, relationships among numbers, and number systems.*

Alternate Performance Indicator (API): NO.1.12 *Identify place value of ones and tens*

Sample Activities:

- When shown a grid with a column for the tens place and a column for the ones place and asked "Which is the tens place?" and "Which is the ones place?" the student will point to the correct column.
- Given a grid with a column for the tens place and a column for the ones place, the student will write numbers 1-20 with each digit in the correct column.
- Given number cards from 1-20 and a set of teddy bear manipulatives, the student will place the bears on the cards to represent the place value (e.g., for the number 32, the student would place three bears in the tens place and two bears in the ones place).
- Given a number card from 1-99 and asked, "How many ones?" and "How many tens?" the student will verbally state the correct number of ones and tens.
- The student will play a "tens and ones" place value game on the computer. The computer shows a number from 0 to 99, and the student uses "virtual" base ten blocks (one block = 1, a strip of 10 blocks = 10) to correctly represent the number shown.
- The student will use an abacus to represent numbers from 1-99.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.1 *The student will understand numbers, ways of representing numbers, relationships among numbers, and number systems.*

Alternate Performance Indicator (API): NO.1.13 *Recognize and engage in use of commutative, associative, and identity properties*

Sample Activities:

- The student will use buttons to represent 1-digit addition problems written on the whiteboard. The teacher will include pairs of problems that demonstrate the commutative property, such as 1+2 and 2+1. The student will use the buttons to work both problems. The teacher will ask questions to guide the student to the realization that the answer is the same, regardless of the order of the numbers.
- Given Popsicle sticks and a series of 3-step, 1-digit addition problems, the student will use the Popsicle sticks to make a visual representation of the problems and solve them using various groupings [e.g., (1+2) + 3 and 1 + (2+3)]. The teacher will ask questions to guide the student to the realization that the answer will be the same, regardless of how the numbers are grouped.
- The student will be given a set of 1" plastic teddy bear manipulatives. On a sheet of tablet paper, the teacher will write ten math problems involving the addition of zero to a single-digit number. Using the bears to visually represent the numbers in each math problem, the student will work each problem. The teacher will ask questions as needed to guide the student to the realization that adding nothing—zero—to any number results in the same number.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.2 *The student will understand meaning of operations and how they relate to one another.*

Alternate Performance Indicator (API): NO.2.1 *Identify the position of a whole number less than 100 on a number line*

Sample Activities:

- Given a ruler, the student will point to a number requested by the teacher.
- Given a walk-on number line with numbers from 1-20, the student will move to the number requested by the teacher.
- Given a number line extending from 1-20 with every other number missing, the student will fill in the missing numbers.
- Given a blank number line extending from 1-20, the student will write each number in its proper position on the number line.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.2 *The student will understand meaning of operations and how they relate to one another.*

Alternate Performance Indicator (API): NO.2.2 *Recognize a whole and its parts*

Sample Activities:

- After listening to a peer read *A Apple Pie* by Gennady Spirin, the student will touch and hold an apple, then watch as it is cut into slices for a snack.
- Given a wooden pizza puzzle and asked, "May I have the whole pizza?" the student will give the questioner the whole pizza puzzle. When asked, "May I have a slice?" or "May I have two slices?" and so on, the student will give the questioner the requested number of slices.
- After helping make and decorate a chocolate sheet cake, the student will verbally identify the finished product as a cake, and then help cut it into slices and distribute the slices among his or her classmates.
- The student will assemble a Mr. Potato Head, with assistance from a peer, who will ask guiding questions, such as "What's missing now?"

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.2 *The student will understand meaning of operations and how they relate to one another.*

Alternate Performance Indicator (API): NO.2.3 *Recognize plus sign*

Sample Activities:

- Given a "hidden picture" with 10 plus signs hidden in it, the student will find and circle all ten plus signs.
- Given magic markers and a large piece of butcher paper, the student will draw plus signs in a variety of colors and sizes all over the butcher paper.
- Given 10 single-digit addition problems written on a whiteboard, the student will use a dry-erase marker to circle the plus sign in each problem.
- Given 20 single-digit addition and subtraction problems (10 addition problems and 10 subtraction problems, in random order), the student will use a dry-erase marker to circle the plus signs in the addition problems.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.2 *The student will understand meaning of operations and how they relate to one another.*

Alternate Performance Indicator (API): NO.2.4 *Determine if a figure has been divided into halves*

Sample Activities:

- During a field trip to Pizza Hut, the student will be given a Personal Pan Pizza. The student and teacher will discuss what the whole pizza looks like and what half a pizza looks like.
- The teacher will give the student a brownie to share with a peer. Before dividing the brownie, the teacher will move the knife to various positions and ask the student if both portions will be equal. If the student answers "yes" incorrectly, the teacher and peer will use guiding questions to help the student realize that one portion is larger and one portion is smaller. When the student correctly identifies the point at which the brownie will be divided into halves, the teacher will cut the brownie and give half to the student and half to the peer.
- Given 32 photographs of objects (apples, oranges, melons, pizzas, cookies, etc.), some of which have been left whole and others of which have been divided into halves, thirds, and quarters, the student will place the items that have been divided into halves into one pile and the rest of the objects into another.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.2 *The student will understand meaning of operations and how they relate to one another.*

Alternate Performance Indicator (API): NO.2.5 *Recognize and identify fractions as parts of wholes (e.g. ½, ¼, ¾, $^1/_3$)*

Sample Activities:

- The student will be given a cardboard "apple pie" cut into quarters. When the teacher presents one of several fraction cards (¾, ½, ¼, etc.), the student will give the teacher a number of slices equal to the fraction shown.
- The student will be given a set of fourteen 4" diameter cardboard "pizzas" with lines drawn on each to show 8 equal slices. When the teacher requests a certain fraction of the pizza ($^1/_8$, $^3/_8$, ¼, etc.), the student will cut one that many slices from one of the pizzas and give them to the teacher.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.2 *The student will understand meaning of operations and how they relate to one another.*

Alternate Performance Indicator (API): NO.2.6 *Using objects or pictures, identify that ½ is greater than ¼*

Sample Activities:

- During preparation for a class snack, two watermelons will be cut. One will be cut in half, the other into quarters. The student will be asked which is larger, ½ or ¼ of the watermelon. The teacher will use guiding questions and statements as needed to help the child come to the realization that ½ is larger than ¼.
- Given four symmetrical cardboard shapes, each divided into quarters, the student will, on request, find ½ and ¼ of each shape and then tell which is greater.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.2 *The student will understand meaning of operations and how they relate to one another.*

Alternate Performance Indicator (API): NO.2.7 *Connect written and pictorial representations of fractions with denominators up to 2*

Sample Activities:

- When asked to give the teacher ½ a chocolate chip cookie, the student will break the cookie in half. The student will keep half the cookie and give the teacher the other half.
- The student will use fraction tiles to model the fractions ½ and $^2/_2$ as represented on a worksheet.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.2 *The student will understand meaning of operations and how they relate to one another.*

Alternate Performance Indicator (API): NO.2.8 *Recognize operational signs (add, subtract, multiply, and divide)*

Sample Activities:

- The student will be given a list of 50 horizontal math sentences involving various combinations of addition and subtraction. The teacher will ask the student to choose a marker and circle the signs that mean addition in blue. After the addition signs have been marked, the student will be asked to circle the subtraction signs in red.
- When provided with a worksheet of 20 horizontal math sentences involving various combinations of addition, subtraction, multiplication, and division, the student will use a calculator to complete the math sentences with the correct order of operations.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.2 *The student will understand meaning of operations and how they relate to one another.*

Alternate Performance Indicator (API): NO.2.9 *Use strategies including rounding to estimate in real world problems*

Sample Activities:

- The student will participate in a class discussion about the shopping list for a class party. The students will approximate the number of each food item needed and estimate the total cost of the items.
- The student will help a group of peers estimate the number of packs of paper needed to bind a given number of copies of a class magazine, which will include poems and short stories written by the students in the class.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.2 *The student will understand meaning of operations and how they relate to one another.*

Alternate Performance Indicator (API): NO.2.10 *Demonstrate awareness that multiplication is repeated addition*

Sample Activities:

- The student will use 1" cubes to visually represent and solve 10 single-digit multiplication problems. For example, 3x2 would be represented as two groups of three blocks each. The student would solve the problem by adding the two groups of three blocks together.
- Given a single-digit multiplication problem written on a whiteboard, the student will use a dry erase marker to represent the problem as a repeated addition problem. For example, 2x6 would be represented as 2+2+2+2+2+2. The student will then solve the problem using Touchpoints.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.3 *The student will solve problems, compute fluently and make reasonable estimates.*

Alternate Performance Indicator (API): NO.3.1 *Solve simple word problems involving whole numbers 0-100*

Sample Activities:

- The student will use 1" blocks to solve simple word problems verbally presented by the teacher (e.g., "You have six blocks. I have two blocks. If I give you one of my blocks, how many will you have?")
- The student and a peer will take turns creating simple word problems. One student will present a word problem, and the other will answer it. Then the roles will be reversed.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.3 *The student will solve problems, compute fluently and make reasonable estimates.*

Alternate Performance Indicator (API): NO.3.2 *Add whole numbers up to 100*

Sample Activities:

- The student will complete a Touchmath sheet of addition problems. Upon completion, the work will be checked by a peer, who will help the student correct any problems missed.
- The student will use a calculator to solve 10 addition problems written on the whiteboard.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.3 *The student will solve problems, compute fluently and make reasonable estimates.*

Alternate Performance Indicator (API): NO.3.3 *Solve real world problems using one to two step addition or subtraction of whole numbers up to 100*

Sample Activities:

- The student will add the cost (rounded to the nearest dollar) of two books he or she plans to buy during the school book drive.
- After being told that there is a stack of twenty 2"x 4" boards in woodworking class and that the student will need four boards for a woodworking project, the student will use subtraction to determine how many boards will be left.
- Given a budget of $100 earmarked to buy items for a local dog rescue organization, the student will use addition and subtraction to help decide how to spend the money. Prices will be rounded up to the next dollar value. The student may use paper and pencil or a whiteboard and dry-erase markers for scratchwork.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.3 *The student will solve problems, compute fluently and make reasonable estimates.*

Alternate Performance Indicator (API): NO.3.4 *Add and subtract whole numbers (no more than two-digits) up to 100*

Sample Activities:

- The student will work with a group of peers to take turns solving two-digit addition and subtraction problems (without regrouping). Next, the students will work together on a computer math program (addition and subtraction). At the end of the lesson, the student will be given an individual worksheet with 10 problems to be worked independently.
- The student will play a *Math Blaster* computer game involving addition and subtraction of whole numbers.
- The student will play the addition game "Hidden Picture" on the website www.aplusmath.com. In this game, each correctly answered addition problem uncovers a section of a hidden picture.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.3 *The student will solve problems, compute fluently and make reasonable estimates.*

Alternate Performance Indicator (API): NO.3.5 *Use calculator in problem solving situations (addition and subtraction and simple multiplication and division)*

Sample Activities:

- The student will use a calculator to solve basic purchasing problems from a Menu Math worksheet about menu planning and grocery shopping.
- The student will use a calculator to complete twelve addition and subtraction problems from page 39 of his/her mathematics workbook.
- Given a calculator and a checkbook transaction sheet with a beginning balance and 30 transactions (addition: deposits, subtractions: checks and debits), the student will add or subtract from the beginning balance to find the correct ending balance based on the 30 transactions.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.3 *The student will solve problems, compute fluently and make reasonable estimates.*

Alternate Performance Indicator (API): NO.3.6 *Apply order of operations when computing with whole numbers using addition, subtraction, multiplication, and division up to 100, with use of a calculator*

Sample Activities:

- When presented with a hand-held calculator, the student will grasp the calculator with one hand.
- Given a hand-held calculator, the student will randomly push the number buttons on request.
- On request, the student will input given numbers into a calculator. For example, the teacher will say, "Where is the number '1?'" and the student will push the number "1."
- When provided with a worksheet of 20 vertical and horizontal math sentences involving various combinations of addition, subtraction, multiplication, and division, the student will use a calculator to complete the math sentences with the correct order of operations.

Content Standard: NUMBERS AND OPERATIONS

Standard: *The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically and graphically to compute fluently and make reasonable estimates in problem solving.*

Alternate Learning Expectation (ALE): NO.3 *The student will solve problems, compute fluently and make reasonable estimates.*

Alternate Performance Indicator (API): NO.3.7 *Use estimation to select a reasonable answer to a real world problem involving whole numbers to 100*

Sample Activities:

- Given paper and a pencil, the student will estimate the number of gallons of gasoline needed to travel from his or her home to a vacation destination of choice. The number of miles and the number of miles per gallon the car gets will be provided (rounded to the nearest whole number).
- Given a sheet with the number of crickets one anole lizard eats in a week, the student will estimate the number of crickets needed to feed two anole lizards for one year.

Content Standard: ALGEBRA

Standard: *The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.*

Alternate Learning Expectation (ALE): A.1 *The student will sort and classify objects by size, number, and other properties.*

Alternate Performance Indicator (API): A.1.1 *Indicate awareness of, react to, explore, and associate color, size, and shape*

Sample Activities:

- Two different colors (red and blue) will be displayed in the student's light box. The student will be presented with three objects: a large red apple, a fuzzy red scarf, and a red ball. The student will be encouraged to touch and explore the red objects as the teacher discusses the color "red." Then the student will be asked to gaze at the matching color in the light box as the teacher places the object near the matching color.
- When the teacher shines two different colored beams of light onto the wall, the student will turn his/her head toward the color requested. (Example: The teacher will say, "Look at the blue light," or "Look at the red light," and the student will do so.)
- The student will use a writing utensil of choice to trace a wooden shape onto paper with assistance.
- The student will choose appropriate colors to complete a realistic drawing during art class. A peer will guide him/her by asking questions, such as, "What color is the sky?" and "What color is grass?"
- Given a variety of objects (balls, crayons, and markers), the student will, on request, verbally identify the color of each.
- The student will sort large stenciled shapes into separate compartments of a sorting tray.
- Given a variety of plastic shapes and asked to "Pick up a [circle, square, triangle], the student will pick up an appropriate shape.
- Given ten coins, four of which are quarters, the student will identify the four coins that are the same (size and color) and use them to make a soft drink purchase from the vending machine.

Content Standard: ALGEBRA

Standard: *The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.*

Alternate Learning Expectation (ALE): A.1 *The student will sort and classify objects by size, number, and other properties.*

Alternate Performance Indicator (API): A.1.2 *Sort objects by up to four attributes (color, size, or shape)*

Sample Activities:

- Given 50 plastic bears and a compartmentalized sorting tray, the student will sort the plastic teddy bear pieces according to color.
- Given 64 crayons in eight different colors and a set of eight colored cups to match the crayons, the student will place the crayons into the matching cups.
- Given a deck of UNO cards containing only the colored number cards, the student will sort them into piles by color (red, blue, green, yellow).
- The student will sort wooden shape pieces according to color and size.
- The student will assist the P.E. teacher in sorting a variety of gym balls (footballs, soccer balls, basketballs, kickballs, etc.) into separate baskets and putting them away.
- The student will sort blue soft-touch round balls and yellow soft-touch footballs from an assortment of soft-touch balls in P.E. class.
- Before purchasing a pencil and erasers from the school bookstore, the student separated his/her coins by size and value.
- The student will sort paper clips by size and color into plastic containers.
- During a visit to the kitchen to make snacks, the student will use the "yes/no" buttons of his/her programmed communication device to identify sets of two given food items as the same or different (for example, salt & sugar, sugar & sugar, Oreos & carrot sticks, etc).

Content Standard: ALGEBRA

Standard: *The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.*

Alternate Learning Expectation (ALE): A.1 *The student will sort and classify objects by size, number, and other properties.*

Alternate Performance Indicator (API): A.1.3 *Identify how objects or numbers have been sorted by two to three attributes*

Sample Activities:

- Three sets of colored plastic shapes (red squares, blue circles, and yellow triangles) will be placed on the table in front of the student. The student will be given five colored shapes, each of which belongs in one of the three groups. On request, the student will place each shape with its correct group.
- A set of blue plastic circles in various sizes will be placed on the table in front of the student. The teacher will ask, "How are these things alike?" If the student answers, "Color," or "Shape" the teacher will say, "Yes! And how else are they alike?" If the student misses either answer (color and shape), the teacher will ask guiding questions and prompting statements to lead the student to the correct answers.

Content Standard: ALGEBRA

Standard: *The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.*

Alternate Learning Expectation (ALE): A.2 *The student will represent and analyze patterns and functions.*

Alternate Performance Indicator (API): A.2.1 *Indicate awareness of, react to, explore, and associate patterns*

Sample Activities:

- Given a set of colored wooden blocks, the student and a peer will take turns arranging the blocks in a variety of patterns.
- Given a string of colored beads strung in a repeating pattern (blue, green, blue, green, etc.), five blue beads, and five green beads, the student will add the ten beads, continuing the pattern.
- Using pattern cards, the student will explain what will come next in a given pattern and attach the missing pattern piece.
- The student will use parquetry blocks to match patterns on parquetry cards.

Content Standard: ALGEBRA

Standard: *The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.*

Alternate Learning Expectation (ALE): A.2 *The student will represent and analyze patterns and functions.*

Alternate Performance Indicator (API): A.2.2 *Recognize two- or three- part repeating pattern*

Sample Activities:

- The student will repeat a three-beat clapping pattern modeled by the teacher,
- Given a string of colored beads strung in a repeating pattern (blue, green, blue, green, etc.), five blue beads, and five green beads, the student will add the ten beads, continuing the pattern.
- On the whiteboard, the teacher will draw a series of two-part repeating patterns. The student will use a dry-erase marker to correctly continue each pattern.

Content Standard: ALGEBRA

Standard: *The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.*

Alternate Learning Expectation (ALE): A.2 *The student will represent and analyze patterns and functions.*

Alternate Performance Indicator (API): A.2.3 *Identify objects as same or different*

Sample Activities:

- Given two concrete objects (ball and book, pencil and toy car, comb and eraser, two matching ceramic frogs, and two identical coffee mugs) the student will identify the objects as the same (thumbs up) or different (thumbs down).
- Given a set of 50 cards, each of which has two objects pictured on it, the student will put the cards with matching objects in one pile and the cards with two different objects in another pile.
- The student will play "Concentration," a matching and memory game.
- The student will play picture dominoes, which requires the student to match the picture on one end of the domino being placed to a picture on a domino on the board.

Content Standard: ALGEBRA

Standard: *The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.*

Alternate Learning Expectation (ALE): A.2 *The student will represent and analyze patterns and functions.*

Alternate Performance Indicator (API): A.2.4 *Identify, extend and describe a numerical or geometric pattern*

Sample Activities:

- The teacher will begin a pattern using geometric blocks. The student will complete the pattern.
- Using geometric blocks, the teacher will place 13 blocks in a 3-block repeating pattern (e.g., red-yellow-blue, red-yellow-blue). The student will correctly extend the pattern by placing the next block in the sequence.
- When presented with a worksheet of five different numerical patterns, each with the last number missing, the student will fill in the blank with the correct number.
- The student will copy patterns from the board and onto construction paper, then analyze the patterns and complete 3 patterns that are incomplete.
- The student will make a bead necklace by repeating a 5-bead pattern until the necklace is complete.

Content Standard: ALGEBRA

Standard: *The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.*

Alternate Learning Expectation (ALE): A.2 *The student will represent and analyze patterns and functions.*

Alternate Performance Indicator (API): A.2.5 *Solve addition and subtraction problems which involve zero*

Sample Activities:

- The student will use Pixie Stix to complete a worksheet involving five addition and subtraction problems involving zero. When all the problems have been worked correctly, the student may choose a Pixie Stick to eat.
- On a worksheet, the student will solve 20 single-digit addition and subtraction problems that involve zero. The student will use manipulative blocks as needed to help solve the problems.

Content Standard: ALGEBRA

Standard: *The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.*

Alternate Learning Expectation (ALE): A.2 *The student will represent and analyze patterns and functions.*

Alternate Performance Indicator (API): A.2.6 *Identify patterns and data represented in graphs (e.g. bar, line, and pictographs)*

Sample Activities:

- The student will ask ten peers which of three movies they like best. With help from the teacher, the student will then make a pictograph representing the answers given.
- The student will complete an activity in his/her math workbook that requires him/her to read and analyze different graphs. He/she will then make original graphs based on the data provided in the workbook.
- Given two bar graphs representing money earned from a bake sale, one of which shows a notably greater amount than the other, the student will, on request, point to the bar graph that shows more.

Content Standard: ALGEBRA

Standard: *The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.*

Alternate Learning Expectation (ALE): A.2 *The student will represent and analyze patterns and functions.*

Alternate Performance Indicator (API): A.2.7 *Demonstrate understanding that an equation is a number sentence stating two quantities are equal (e.g., 2+3=5 or 2+3=4+1)*

Sample Activities:

- Given laminated math sentence strips and a dry-erase marker, the student will use a calculator to determine whether the two sides of the equation are equal. The student will then circle the equal sign if the two sides of the equation are equal and will put an "X" on the equal sign if the two sides of the equation are not equal.

Content Standard: ALGEBRA

Standard: *The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.*

Alternate Learning Expectation (ALE): A.3 *The student will use concrete, pictorial, and verbal representations to develop an understanding of the language and symbols of mathematics.*

Alternate Performance Indicator (API): A.3.1 *Use concrete objects or pictures to demonstrate addition and subtraction number sentences involving numbers 0-100*

Sample Activities:

- Given 50 uncooked pinto beans and a sheet of paper to place them on, the student will use the beans to represent single-digit addition problems verbally presented by the teacher. (For example, the teacher will say, "Two," and the student will place 2 beans on the paper; then the teacher will say "Plus three," and the student will add 3 beans, for a total of 5. Or, the teacher will say, "Seven," and the student will place 7 beans; then the teacher will say "Minus four," and the student will remove 4 beans.)
- Given plastic counters and ten addition number sentences, each written on a separate card, the student will place the correct number of counters beneath each number written, then place the correct number of counters to the right of the equals sign to complete the number sentence. (For example, for 2 + 7 = ?, the student will place 2 counters on the number "2," 7 counters on the number "7," and 9 counters to the right of the equals sign.)

Content Standard: ALGEBRA

Standard: *The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.*

Alternate Learning Expectation (ALE): A.3 *The student will use concrete, pictorial, and verbal representations to develop an understanding of the language and symbols of mathematics.*

Alternate Performance Indicator (API): A.3.2 *Solve open sentences involving addition or subtraction up to 100*

Sample Activities:

- The student will play the computer game "Algebra Planet Buster" at www.aplusmath.com, which involves solving addition and subtraction problems with one variable.
- The student will complete a worksheet of ten subtraction problems involving one variable.

Content Standard: ALGEBRA

Standard: *The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.*

Alternate Learning Expectation (ALE): A.3 *The student will use concrete, pictorial, and verbal representations to develop an understanding of the language and symbols of mathematics.*

Alternate Performance Indicator (API): A.3.3 *Connect open sentences to real world situations*

Sample Activities:

- Using grocery ads and a calculator, the student will calculate the cost of multiple items on a predetermined grocery list.
- While stocking items on the shelf at his/her jobsite, the student will connect open sentences to the task at hand. (Example: "You have six spaces for cans of corn. How many cans do you need from the box?" and "If I get six boxes of macaroni and you get four boxes, how many will the two of us together put on the shelf?)

Content Standard: ALGEBRA

Standard: *The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.*

Alternate Learning Expectation (ALE): A.3 *The student will use concrete, pictorial, and verbal representations to develop an understanding of the language and symbols of mathematics.*

Alternate Performance Indicator (API): A.3.4 *Represent the idea of a variable as an unknown quantity using a letter or a symbol*
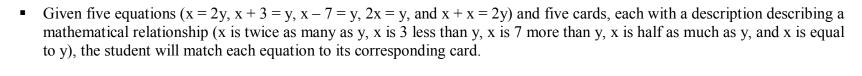

Sample Activities:

▪ Given a set of five cards that provide information about a mathematical problem, the student will verbally help a peer write an open sentence representing the problem using an "x" for the value not known. (For example, one card will say, "Between them, John and Cindi have twenty apples. John has seven apples. How many apples does Cindi have? The student and a peer will devise a number sentence—using variables—that correctly reflects this information: 20 – 7 = X or 7 + X = 20 or equivalent.)

Content Standard: ALGEBRA

Standard: *The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.*

Alternate Learning Expectation (ALE): A.3 *The student will use concrete, pictorial, and verbal representations to develop an understanding of the language and symbols of mathematics.*

Alternate Performance Indicator (API): A.3.5 *Select an equation that represents a given mathematical relationship*

Sample Activities:

- Given five equations ($x = 2y$, $x + 3 = y$, $x - 7 = y$, $2x = y$, and $x + x = 2y$) and five cards, each with a description describing a mathematical relationship (x is twice as many as y, x is 3 less than y, x is 7 more than y, x is half as much as y, and x is equal to y), the student will match each equation to its corresponding card.

Content Standard: GEOMETRY

Standard: *The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one, two, and three dimensional figures.*

Alternate Learning Expectation (ALE): G.1 *The student will analyze characteristics and properties of geometric shapes.*

Alternate Performance Indicator (API): G.1.1 *Identify and/or name given shapes (circles, squares, triangles, and rectangles)*

Sample Activities:

- The student will grasp a tennis ball (circular object) presented by the teacher.
- The student will remove blocks from a pail and place them into two groups: squares and circles.
- The student will identify circles and squares by pointing to the correct one on a shape board on request.
- The student will play catch using rubber toys in a variety of geometric shapes (circle, square, triangle, and rectangle). The student will name each shape as it is tossed to a partner.
- The student will be given three construction paper shapes (circle, square, and rectangle). When the teacher names an object, the student will hold up the shape that best represents the objects. (Example: If the teacher says, "window," the student will hold up the rectangle. If the teacher says "pancake," the student will hold up the circle.")
- Using magnetic shapes and a whiteboard, the student will correctly identify a circle, square, triangle, and rectangle by placing the shape on the board when the teacher names it.
- Using magnetic shapes and a whiteboard, the student will correctly identify a circle, square, triangle, and rectangle by naming each shape as the teacher places it on the board.
- Given crayons and a worksheet with a variety of shapes, student will color only the squares on the worksheet.
- The student will verbally identify circles and squares in a winter picture he/she completed using geometric shapes.
- Cardboard shapes in a variety of colors are placed around the room. The student will participate in a game in which the teacher calls out a color and shape and the student whose turn it is has to go to the cardboard shape that matches the description.
- After listening to the book *The Speedy Triangle,* the student will construct triangles using pipe cleaners.

Content Standard: GEOMETRY

Standard: *The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one, two, and three dimensional figures.*

Alternate Learning Expectation (ALE): G.1 *The student will analyze characteristics and properties of geometric shapes.*

Alternate Performance Indicator (API): G.1.2 *Recognize and/or name circles, squares, triangles, and rectangles in the environment*

Sample Activities:

- The student will be given a cut-out circle, triangle, square, and rectangle and asked to find objects in the room with the same shape. The objects found will then be listed on the corresponding cut-out shape.
- During a walk around the school, the student will accurately identify the shapes of various objects, such as the rectangular glass in a classroom window or the circular shape of a paper plate.

Content Standard: GEOMETRY

Standard: *The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one, two, and three dimensional figures.*

Alternate Learning Expectation (ALE): G.1 *The student will analyze characteristics and properties of geometric shapes.*

Alternate Performance Indicator (API): G.1.3 *Reproduce and create circles, squares, triangles, and rectangles*

Sample Activities:

- Given a highlighter and four shapes drawn by an adult, the student will use the highlighter to trace each of the shapes.
- The student will make wrapping paper by making potato prints on butcher paper. (To make a potato print, cut a potato in half. On the flat part of half the potato, the area around a geometric shape is cut away, leaving a raised shape, which is dipped in paint and used as a stamp.)
- The student will use Colorform shapes (circles, squares, triangles, and rectangles) to make pictures.
- The student will use colored chalk to make sidewalk pictures using circles, squares, triangles, and rectangles.

Content Standard: GEOMETRY

Standard: *The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one, two, and three dimensional figures.*

Alternate Learning Expectation (ALE): G.1 *The student will analyze characteristics and properties of geometric shapes.*

Alternate Performance Indicator (API): G.1.4 *Identify two- or three- dimensional shapes given defining attributes (i.e., square, triangle, circle, and rectangle)*

Sample Activities:

- The student will walk through the school grounds trying to identify environmental/survival word signs (stop, danger, do not enter, men, women, restrooms, enter, exit, keep out, beware of dog). Flash cards and duct tape will be used to provide some signs (labels) not readily present in the environment.
- The student and a peer will play a guessing game in which one player describes a geometric shape (e.g., I am round, with no corners or edges) and the other guesses which shape is being described.

Content Standard: GEOMETRY

Standard: *The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one, two, and three dimensional figures.*

Alternate Learning Expectation (ALE): G.1 *The student will analyze characteristics and properties of geometric shapes.*

Alternate Performance Indicator (API): G.1.5 *Recognize geometric figures that are the same size and shape*

Sample Activities:

- Given a basket containing plastic geometric shapes (triangle, circle, rectangle, and square) in a variety of colors and sizes, the student will sort the items according to size and shape.
- Given a set of laminated cards, each with a pair of geometric shapes (with some pairs being identical in size and shape and others being different), the student will use a grease pencil to circle the pairs that are the same and put and "x" on the pairs that are different.
- On a worksheet that has five shapes on the left and five shapes on the right that are identical in size and shape, the student will draw a line from each shape to its match.

Content Standard: GEOMETRY

Standard: *The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one, two, and three dimensional figures.*

Alternate Learning Expectation (ALE): G.1 *The student will analyze characteristics and properties of geometric shapes.*

Alternate Performance Indicator (API): G.1.6 *Identify if a geometric figure has been divided into two equal parts*

Sample Activities:

- The student will be given a file folder with a pocket on each side, one marked "yes" and one marked "no." The student will also be given a set of 20 cards printed with geometric shapes. Some of the shapes have been divided into two equal parts, and others have not. The students will place the shapes that have been divided into two equal parts into the pocket marked "yes" and the rest into the pocket marked "no."
- The teacher will draw a series of shapes on the whiteboard, and the student will use a dry-erase marker to divide them into two equal parts.

Content Standard: GEOMETRY

Standard: *The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one, two, and three dimensional figures.*

Alternate Learning Expectation (ALE): G.1 *The student will analyze characteristics and properties of geometric shapes.*

Alternate Performance Indicator (API): G.1.7 *Recognize similar geometric figures (i.e. circle, square, rectangle, triangle)*

Sample Activities:

- The student will be given ten everyday items (household items, tools, office supplies, etc.) and must select the geometric figure that is the same shape.
- Given ten pictures of single objects, the student will identify the geometric figure that most nearly matches the pictured item in shape.
- On a field trip to a local grocery store, the student will match items found in a store to the geometric figure that it most closely matches. (Example: Circle = Pizza, Square = Square Kleenex Box, Rectangle = Spaghetti Box, Sphere = Orange; Triangle = Doritos.)

Content Standard: GEOMETRY

Standard: *The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one, two, and three dimensional figures.*

Alternate Learning Expectation (ALE): G.1 *The student will analyze characteristics and properties of geometric shapes.*

Alternate Performance Indicator (API): G.1.8 *Identify different types of polygons (e.g. pentagon, hexagon, octagon)*

Sample Activities:

- Given a set of five felt polygons, the student will point to each polygon as the teacher names it.
- Given a set of five felt polygons and labels naming them, the student will place the polygons on a felt board with each label beneath the polygon it names.

Content Standard: GEOMETRY

Standard: *The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one, two, and three dimensional figures.*

Alternate Learning Expectation (ALE): G.2 *The student will specify locations and describe spatial relationships.*

Alternate Performance Indicator (API): G.2.1 *Recognize and show terms of relative position and direction in a variety of situations (e.g. over, under, left, right, above, below, forward, backward, between, before, after)*

Sample Activities:

- Given a basket of colored blocks, the student will play a game in which a peer names a block color and position (example: "blue block, under the desk" or "red block, between the pencil sharpener and the Kleenex box") and the student places the correct block in the position given.
- The student will enter his/her assigned number into the cafeteria keypad by following verbal instructions from a peer regarding the position of each number on the keypad (above, below, beside, top, and bottom).
- While playing a board game with peers, the student will verbally describe the relative position of the other players. (Example: "Is Joey behind you or in front of you?")
- Given a box containing several toy animals and a set of 20 direction cards, the student will read the cards and use the toys to follow the directions. (Example: "Put the dog in the box and a rabbit under the table.")
- Given a set of cards, each with a position word written on it, the student will choose the card that matches a position or direction modeled by a peer. (Example: If the peer holds a kickball under his/her foot, the student should choose the word "under." If the peer holds the kickball on top of his/her head, the student should choose the word "over" or the word "above.")
- When given a teddy bear and verbal instructions to place the bear in a given location, the student will place the bear in the appropriate location. (Example: Put the bear on top of the pencil sharpener.)
- Given a worksheet with objects in the over and under positions, and asked to mark the ones that are "under," the student will place an "X" on the objects that are under something.

Content Standard: GEOMETRY

Standard: *The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one, two, and three dimensional figures.*

Alternate Learning Expectation (ALE): G.2 *The student will specify locations and describe spatial relationships.*

Alternate Performance Indicator (API): G.2.2 *Identify a line*

Sample Activities:

- The student will use colored pencils and a ruler to make a design comprised only of straight lines.
- Given five lines and five solid shapes drawn on the whiteboard, the student will use a laser pointer to identify the lines.
- When the teacher draws a line on the chalkboard and asks, "What is this," the student will verbally state that it is a line.

Content Standard: GEOMETRY

Standard: *The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one, two, and three dimensional figures.*

Alternate Learning Expectation (ALE): G.2 *The student will specify locations and describe spatial relationships*.

Alternate Performance Indicator (API): G.2.3 *Identify parallel and intersecting lines*

Sample Activities:

- Given ten 3 x 5 cards that show parallel and intersecting lines, the student will use a communication board to identify the type of lines on each card.
- Given construction paper, a ruler, and writing utensils of choice, the student will create examples of parallel and perpendicular lines on request.

Content Standard: GEOMETRY

Standard: *The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one, two, and three dimensional figures.*

Alternate Learning Expectation (ALE): G.2 *The student will specify locations and describe spatial relationships.*

Alternate Performance Indicator (API): G.2.4 *Determine the distance between two points on a number line*

Sample Activities:

- Given a number line that extends from 1-10, the student will point to each unit in sequence. Upon request, the student will move his or her finger forward a given number of units.
- The student will be given a number line that extends from 1-10 and asked to point to a specific number. The student will then be asked to count the number of units from the starting number to a greater number.

Content Standard: GEOMETRY

Standard: *The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one, two, and three dimensional figures.*

Alternate Learning Expectation (ALE): G.2 *The student will specify locations and describe spatial relationships.*

Alternate Performance Indicator (API): G.2.5 *Identify line segments, angles, and polygons by similar shape and size*

Sample Activities:

- Shown a card with an angle on it and asked to find angles in the classroom, the student will identify (verbally and by pointing) typical classroom objects such as corners, books, desk edges, etc.
- At the teacher's request, the student will point out lines, line segments, parallel lines, perpendicular lines, obtuse angles, right angles, and acute angles in real classroom objects (e.g., right angle in a corner where the walls meet, two parallel lines in the wood floor, intersecting lines in the two blades of a pair of scissors, etc.).

Content Standard: GEOMETRY

Standard: *The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one, two, and three dimensional figures.*

Alternate Learning Expectation (ALE): G.2 *The student will specify locations and describe spatial relationships.*

Alternate Performance Indicator (API): G.2.6 *Measure the sides of an angle using standard or non-standard unit of measurement*

Sample Activities:

- Given a ruler and four cardboard boxes of different sizes, the student will measure both sides of at least one angle found in each box.
- Given a worksheet with ten angles and a teacher-made measuring device (a 3" strip of paper divided into ten equal units), the student will use the measuring device to determine the length in units of the sides of each angle. The student will then label each pictured angle with the correct number of units for each side.

Content Standard: GEOMETRY

Standard: *The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one, two, and three dimensional figures.*

Alternate Learning Expectation (ALE): G.2 *The student will specify locations and describe spatial relationships.*

Alternate Performance Indicator (API): G.2.7 *Use a calculator to solve real world problems involving area and perimeter*

Sample Activities:

- When presented with a handheld calculator, the student will grasp the calculator in one hand.
- When presented with a handheld calculator, the student will use one finger to push the calculator buttons at random.
- When presented with a handheld calculator, the student will push the buttons associated with specific numbers requested by the teacher.
- The student will participate in a group project about Vikings, in which the dimensions of a Viking longhouse replica are outlined with string. The student and peers will explore perimeter by walking along the outside of the outline and counting the number of steps it takes to go completely around the outline. To explore the relationship between perimeter, area, and the lengths of the sides, the student and peers will then be given 12"x 12" tile squares. The student and peers will lay out the tiles and count them to determine how many tiles are needed to outline the perimeter versus how many tiles are needed to cover the interior area.
- The student will use a calculator to determine how many 1" sections of fence will be needed to enclose a 4"x 6" garden plot.
- The student will use a calculator to determine how much carpet will be needed to cover the floor of a playhouse to be used as a class reading center.

Content Standard: GEOMETRY

Standard: *The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one, two, and three dimensional figures.*

Alternate Learning Expectation (ALE): G.2 *The student will specify locations and describe spatial relationships.*

Alternate Performance Indicator (API): G.2.8 *Create a picture from memory made up of geometric shapes*

Sample Activities:

- The student will be given a set of plastic tangram shapes. When shown a card depicting a picture made from those shapes, the student will use the shapes to duplicate the picture.
- When given a set of plastic tangram shapes and shown a tangram picture card for 15 seconds, the student will use the tangram shapes to reproduce the picture from memory.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.1 *The student will demonstrate understanding of units of measure and measurable attributes of objects.*

Alternate Performance Indicator (API): M.1.1 *Identify which is larger/smaller, longer/shorter, taller/shorter, heavier/lighter, or which holds more/less when given two similar objects*

Sample Activities:

- When presented with two colored straws of different lengths, the student will point to the longer straw.
- During P.E., the teacher will present the student with five sets of two balls visibly different in size. For each set of two, the student will verbally state which is bigger and which is smaller.
- Given a series of objects of varying weights (a block, a brick, a playground ball, a basketball, a pencil, a feather, an iron, a teddy bear, a paperback book, and a heavy dictionary), the student will lift each one and verbally state whether it is lighter or heavier than each of the others.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.1 *The student will demonstrate understanding of units of measure and measurable attributes of objects.*

Alternate Performance Indicator (API): M.1.2 *Indicate awareness of, react to, explore, and associate temperature*

Sample Activities:

- The student will react with facial expressions and vocalizations as the teacher touches the student's hands and cheeks with, alternately, a cool washcloth and a warm buckwheat pillow.
- Given a bowl of ice and a bowl of warm rice, the student will use his/her hands to explore the two materials with hand-over-hand assistance. The student will indicate the change in temperature with changes in facial expression.
- Given a choice of two cartons of milk, one cold and one room temperature, the student will choose the one that is cold.
- Given a toy boat and two bowls of water, one hot and one cold, the student will avoid the hot and water and play with the toy boat in the cold water.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.1 *The student will demonstrate understanding of units of measure and measurable attributes of objects.*

Alternate Performance Indicator (API): M.1.3 *Recognize clocks and watches as instruments for measuring time*

Sample Activities:

- When given a watch, a book, and a camera and asked which one is used to tell time, the student will point to the watch.
- The student and a peer will go for a walk around the school. The peer will point to various objects, including clocks and watches, and ask "what do we do with that?" When asked about a clock or watch, the student will respond by saying that the clock or watch is used to tell time.
- Given a stack of sixteen picture cards (four clocks, four watches, and eight miscellaneous items that are not used for measuring time), the student will place the pictures of "things we use to tell time" in one stack and the other items in a different stack.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.1 *The student will demonstrate understanding of units of measure and measurable attributes of objects.*

Alternate Performance Indicator (API): M.1.4 *Recognize a thermometer as a device to measure temperature*

Sample Activities:

- When given a watch, a book, a camera, and a thermometer and asked which one is used to measure temperature, the student will point to the thermometer.
- The student and a peer will go for a walk around the school. The peer will point to various objects, including thermometers, and ask "what do we do with that?" When asked about a thermometer, the student will respond by saying that it is used to tell the temperature, or to tell how hot or cold it is.
- Given a stack of sixteen picture cards (eight thermometers of different types and eight miscellaneous items that are not used for measuring temperature), the student will place the pictures of "things we use to tell how hot or cold something is" in one stack and the other items in a different stack.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.1 *The student will demonstrate understanding of units of measure and measurable attributes of objects.*

Alternate Performance Indicator (API): M.1.5 *Identify the days of the week on a calendar*

Sample Activities:

- The student will be provided with a current calendar and the numbers 1-31. The student will place each number in its correct position on the calendar by matching the dates.
- The student delivers items to different classrooms daily as an office worker. Prior to beginning his or her "delivery route" the student will point to the current day on the calendar and verbally state what day of the week it is and which classrooms are to be served on this day.
- Given a one-month calendar and the days of the week on Velcro-backed index cards, the student will put each day of the week in its correct location when it is read aloud to him.
- The student will independently walk to the calendar and place the Velcro-backed "days of the week" cards in their proper spots on the calendar.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.1 *The student will demonstrate understanding of units of measure and measurable attributes of objects.*

Alternate Performance Indicator (API): M.1.6 *Demonstrate awareness of measurement using a measuring tool*

Sample Activities:

- Given a computer-based measuring program to be used in a laptop computer, the student will match measuring tools to the objects they would be used to measure (i.e., teaspoon to sugar, thermometer to temperature).
- Given a ruler and a tape measure, the student will determine and compare the lengths of ten everyday objects of choice (such as a pencil, a table, a book, a spoon, a basketball, a peer's shoe, his/her own foot, the class aquarium, a stapler, and the teacher's desk).
- The student will use a ruler and a yardstick to measure the distance a Matchbox car can travel on various surfaces, such as fabric, wood, grass, sand, and linoleum. Ramps made from books and blocks will be used to determine their effect on the car's distance.
- During a group project in Home Economics I, the student will help make a cake, including using a variety of measuring cups and measuring spoons to measure ingredients.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.1 *The student will demonstrate understanding of units of measure and measurable attributes of objects.*

Alternate Performance Indicator (API): M.1.7 *Demonstrate the understanding of time (i.e. digital clock, analog clock)*

Sample Activities:

- While out on the track with the P.E. teacher, the student will use a stop watch to measure the running speed of peers for 100 meters.
- During music class, the student will look at the clock and tell the teacher when it is time to change classes by matching the hands on the classroom clock to the sample clock taped to the student's wheelchair tray.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.1 *The student will demonstrate understanding of units of measure and measurable attributes of objects.*

Alternate Performance Indicator (API): M.1.8 *Identify appropriate tools to measure perimeter, weight, length, and volume (e.g. measuring cup for cooking, yardstick for height, scales for weight)*

Sample Activities:

- The student will use appropriate measuring tools (measuring spoons, measuring cups, food scales, etc.) to help prepare deviled eggs and chocolate cupcakes for the annual Thanksgiving dinner held by the Life Skills class for parents, teachers, job coaches, and central office staff. The student signs up for the dish or dishes he or she wishes to prepare. All tools and foods are set out beforehand based on what the recipe card says is needed.
- The student will be given a measuring cup, a ruler, a yardstick, a set of scales, and a set of measuring spoons and asked to measure five different items (a cup of sugar, a paperback book, the teacher's desk, a pound of flour, and a teaspoon of cinnamon). The student will choose the correct tool for measuring each item and then attempt to measure it.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.1 *The student will demonstrate understanding of units of measure and measurable attributes of objects.*

Alternate Performance Indicator (API): M.1.9 *Recognize and follow a simple daily schedule*

Sample Activities:

- Given five sets of 3 action picture/word cards numbered 1-3, the student will perform the actions in the order specified by the cards. (The sequences are as follows. Card 1: jump, sit down, stand up. Card 2: go through the tunnel, clap your hands, use the Hula Hoop. Card 3: do a somersault, do some jumping jacks, stand on one foot. Card 4: hop, put your hands on your head, make a funny face. Card 5: sing a song, spin around, march around the room.)
- The student will follow a series of step-by-step sequence cards (with words and pictures) to make two pieces of buttered toast in the housekeeping center.
- The student will follow a series of step-by-step sequence cards (with words and pictures) to do a load of laundry in the housekeeping center.
- The student will follow a series of step-by-step sequence cards (with words and pictures) to make a batch of chocolate chip cookies in the housekeeping center.
- When shown his or her picture schedule and asked, "What comes next?" the student will verbally name the next activity noted on the schedule.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.1 *Use words to describe time (e.g. day, night, morning, afternoon, yesterday, today, tomorrow)*

Sample Activities:

- When shown five pictures clearly representing day and five pictures clearly representing night, the student will verbally identify each as day or night.
- The student will draw pictures to illustrate different times of day, and then label the pictures with the correct word for the time illustrated by the picture (e.g., morning, afternoon, evening, night, etc.).

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.2 *Use words to describe temperature (e.g. hot, cold, cool, warm)*

Sample Activities:

- When shown pictures of people dressed for various weather conditions, the student will state whether the temperature seems hot or cold, based on the clothing worn by the subjects of the pictures.
- When picture cards depicting various temperatures (i.e., a steaming pie, a boy building a snowman, a girl swimming in the ocean on a hot day, etc.) are held up in front of the student, the student will verbally describe each picture, including an explanation of what temperature is being depicted and what evidence in the picture supports this conclusion.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.3 *Measure length of an object to the nearest foot and/or inch or half inch*

Sample Activities:

- The student will use a 12-inch ruler and 60-inch measuring tape to measure various objects in the classroom (e.g., pencil, belt, shoe, pen, sheet of paper, etc.) to the nearest ½ inch.
- Using a ruler, the student will work with a peer to measure items from a workbook page to the nearest inch.
- The student will use a tape measure to measure the length of five different vehicles parked in the parking lot. (Permission from the owners will be obtained prior to the activity.)

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.4 *Tell time to the hour, half hour, quarter hour, and to the five minute intervals*

Sample Activities:

- The student will construct a paper plate clock from construction paper, a brad, and a paper plate. Then the student will set the clock to various times (to the hour) as requested by the teacher.
- Using a computer program and a switch adapted for his or her wheelchair, the student will match pictures of digital clocks to pictures of analog clocks showing the same time. The clocks will depict times to the hour and half hour. A peer will use the mouse to move the cursor over each answer choice, and the student will use the switch to click on the correct answer.
- When the teacher orally presents a time (in quarter-hour increments) to the student, the student will set a small, hand-held analog clock to the stated time.
- Ten cards that have clock faces on them (showing different times by the quarter hour) will be laid out on the student's desk. A peer will ask the student to point to the clock showing a specific time, and the student will point to the requested clock. (Example: "Point to the clock that says 4:15.")

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.5 *Mark specified days/dates on a calendar*

Sample Activities:

- Given ten specific dates (e.g., holidays, half-days, ball games, etc.), the student will write the dates on the calendar pages of his agenda book.
- Given a calendar for the month of December, the student will use stickers to mark the following special dates: Christmas day, the school play, winter break begins, Christmas party, a peer's birthday.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.6 *Count units to find the perimeter of a square using a grid*

Sample Activities:

- The student will walk around the perimeter of various-sized squares (from 3'x 3' to 10'x 10') outlined in masking tape.
- The student will use a ruler to measure the perimeter (in feet) of various-sized squares (from 3'x 3' to 10'x 10') outlined in masking tape.
- Given a sheet of graph paper with ten straight lines (five vertical and five horizontal) drawn on it, the student will count the units of the grid to measure each line.
- Given a sheet of graphing paper with five squares drawn on it, the student will count the units of the grid to measure each side of each square.
- Given a sheet of graphing paper with five squares drawn on it, the student will count the units of the grid to measure the perimeter of each square.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.7 *Use standard units to measure length*

Sample Activities:

- The student will use a 12-inch ruler and 60-inch measuring tape to measure the length of various concrete objects in the classroom (e.g., pencil, belt, shoe, pen, sheet of paper, etc.) to the nearest inch.
- As part of a group activity, the student will lie down on a sheet of butcher paper while a teacher uses a marker to outline the student's body. The student will use markers, crayons, colored pencils, yarn, buttons, and other materials to add clothing, hair, and features. All the class "portraits" will be attached to the wall. Then all the students will use measuring tapes to measure and compare the length of their portraits.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.8 *Solve real world problems involving temperature (e.g. Fahrenheit)*

Sample Activities:

- During a class discussion in Agriculture I class, the student will help troubleshoot problems cold weather can cause for horses and help brainstorm solutions (such as windbreaks and blankets).
- Given five pictures of thermometers, each representing a different temperature (Fahrenheit), the student will verbally state which of the thermometers represent cold weather ("when we need a coat") and which represent hot weather ("when we can go swimming").

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.9 *Solve real world problems involving addition and subtraction of measurement using inches*

Sample Activities:

- During shop class, the student will (with help from a peer) determine how many inches to cut from each of 6 boards in order to make a wooden birdhouse.
- During a class project in which an elderly neighbor's back yard is turned into a hummingbird garden, the student will help measure the distance between various elements of the landscaping (e.g., the distance between the hollyhocks and the butterfly weed).

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.10 *Read temperatures on a thermometer to the nearest degree*

Sample Activities:

- With help as needed, the student will make a construction paper thermometer with a red line that can be manipulated to represent various temperatures. Then the teacher will name temperatures (in 5- or 10- degree increments), and the student will "set" his or her thermometer to the given temperature.
- In the library during study hall, the student will complete a worksheet matching thermometers to temperatures.
- Given a set of ten card picturing thermometers showing various temperatures, the student will tell the teacher what temperature is represented by each thermometer.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.11 *Use estimation to determine if a length or volume measurement is reasonable*

Sample Activities:

- Given the measurements for an aquarium and told a specific amount of water, the student will use estimation to determine whether the aquarium could hold the given amount of water. The student may use scratch paper or may simulate the size of the aquarium using drawings, blocks, rulers, etc. to help visualize the information given in the problem.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.12 *Solve real world problems involving time*

Sample Activities:

- With assistance from peers during a group activity, the student will construct a timeline that displays the events of World War I in chronological progression.
- The student will complete a teacher-made worksheet of ten problems involving measurement of time.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.13 *Solve real world problems involving length*

Sample Activities:

- The student will determine the length of ribbon needed to trim an apron made in home economics class.
- The student will determine the length and number of boards needed to make a 5'x 5' log cabin for the Homecoming float.
- The student will determine the dimensions of a bolt of fabric needed to create a table drape for a class open house.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.14 *Convert yards to feet and feet to inches*

Sample Activities:

- Given a yardstick, three rulers, and 36 one-inch squares, the student will explore the relationship between the units (for example, by placing the three rulers end-to-end and seeing that they are they same length as the yardstick, by lining up 12 squares to equal one ruler, by placing 36 squares alongside three rulers, and so on). The teacher will use guiding questions as needed to help the student discover the relationships.
- Given two yardsticks, six rulers, and 72 one-inch squares, the student will use these measuring devices to answer "conversion" questions asked by the teacher (e.g., "If you have two yards, how many feet—rulers—do you have?" or "If you have three feet, how many inches do you have?").
- The student will complete a worksheet (using a calculator if needed) involving conversion of yards to feet.
- The student will complete a worksheet (using a calculator if needed) involving the conversion of feet to inches.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.15 *Create and use a daily schedule*

Sample Activities:

- When shown his or her picture schedule and asked, "What comes next?" the student will verbally name the next activity noted on the schedule.
- The student will verbally describe his or her daily activities to the teacher. The teacher will write down the student's schedule in the form of a list. Then the student will cut the list into strips, one strip per activity. With help as needed, the student will put the strips in sequential order and glue them to stiff cardboard backed with Velcro. The student will look through magazines to find a picture to represent each activity listed. The pictures will be added to the appropriate strips, creating a picture schedule.
- The student will help make picture sequence cards to show the steps involved in making Kool-Aid. The student will then use the cards to make Kool-Aid for the class.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.16 *Identify what can be measured about objects in the environment (e.g. what about a table can be measured? Length, width, height)*

Sample Activities:

- The student will help measure the classroom aquarium. The teacher will ask guiding questions or make prompting statements to help the student realize that the aquarium has multiple dimensions, each of which can be measured.
- The student and a peer will go on a "Measuring Walk" around the school and playground. The peer will point to various objects, such as the playground slide and the cafeteria tables, and ask, "What could we measure about this? Is there anything else we could measure about it?" Then the student and peer will measure each of those aspects of the object.

Content Standard: MEASUREMENT

Standard: *The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-word problems.*

Alternate Learning Expectation (ALE): M.2 *The student will apply appropriate techniques and tools to determine measurements.*

Alternate Performance Indicator (API): M.2.17 *Solve real world problems using yesterday, today, and tomorrow*

Sample Activities:

- The teacher will ask the student whether various specific events occurred yesterday, occurred (or will occur) today, or will occur tomorrow, and the student will verbally supply the correct answer. Examples of the questions asked are: "When did we have hamburgers for lunch?" "When will we go to music class?" and "When did Sara lose her pencil?"
- The student will verbally answer questions about events that occurred yesterday, occurred (or will occur) today, or will occur tomorrow. Examples of the questions asked are: "What did you have for dinner yesterday?" "Where are you going after school tomorrow?" and "What happened in P.E. today?"

Content Standard: DATA ANALYSIS AND PROBABILITY

Standard: *The student will understand and apply basic statistical and probability concepts in order to organize and analyze data and to make predictions and conjectures.*

Alternate Learning Expectation (ALE): DAP.1 *The student will develop, select, and use appropriate methods to collect, organize, display, and analyze data.*

Alternate Performance Indicator (API): DAP1.1 *Recognize representations of data using concrete objects, pictures, and simple graphs (e.g. pictographs)*

Sample Activities:

- The student will use various magazines or newspaper supplements to locate ads about personal items, food, or clothing. The student will then cut them out and add them to a journal for a later discussion.
- Given a simple pictograph representing one child with red hair and three children with brown hair, the student will, on request, point to the column that shows how many children have red hair and then to the column that shows how many children have brown hair.

Content Standard: DATA ANALYSIS AND PROBABILITY

Standard: *The student will understand and apply basic statistical and probability concepts in order to organize and analyze data and to make predictions and conjectures.*

Alternate Learning Expectation (ALE): DAP.2 *The student will apply basic concepts of probability.*

Alternate Performance Indicator (API): DAP2.1 *Determine whether an event is possible or impossible*

Sample Activities:

- After listening to the legend of Pecos Bill, the student will verbally discuss which events in the story could actually happen and which could not.
- The teacher will verbally describe ten separate events, some of which are possible and some of which are impossible. After each event is described, the student will tell whether or not the event could happen. Upon request, the student will explain why the event could or could not happen.

Content Standard: DATA ANALYSIS AND PROBABILITY

Standard: *The student will understand and apply basic statistical and probability concepts in order to organize and analyze data and to make predictions and conjectures.*

Alternate Learning Expectation (ALE): DAP.2 *The student will apply basic concepts of probability.*

Alternate Performance Indicator (API): DAP2.2 *Interpret data displayed in simple pictographs*

Sample Activities:

- Given a simple pictograph representing one child with red hair and three children with brown hair, the student will verbally tell how many children have red hair and how many children have brown hair.
- The student will take part in a class project in which each student tries four different pies (chocolate, pecan, pumpkin, and custard) and places a paper pie in the pictograph column representing his or her favorite kind of pie. The student will use the completed pictograph to determine how many students in the class like each kind of pie.

Content Standard: DATA ANALYSIS AND PROBABILITY

Standard: *The student will understand and apply basic statistical and probability concepts in order to organize and analyze data and to make predictions and conjectures.*

Alternate Learning Expectation (ALE): DAP.2 *The student will apply basic concepts of probability.*

Alternate Performance Indicator (API): DAP2.3 *Interpret bar graphs with no more than two data items*

Sample Activities:

- The teacher will ask each student in the class whether he or she prefers cats or dogs. Each answer will be represented in one column of a bar graph. The student will look at the bar graph and verbally indicate which animal is preferred by more classmates.
- Given a bar graph comparing people who prefer to get up early and people who prefer to sleep late, the student will verbally indicate which group is the largest, how many are in each group, and the difference (in units) between the two groups.

Content Standard: DATA ANALYSIS AND PROBABILITY

Standard: *The student will understand and apply basic statistical and probability concepts in order to organize and analyze data and to make predictions and conjectures.*

Alternate Learning Expectation (ALE): DAP.2 *The student will apply basic concepts of probability.*

Alternate Performance Indicator (API): DAP2.4 *Connect data in tables to pictographs*

Sample Activities:

- Given a completed table with three rows (students who prefer bicycles, students who prefer skateboards, and students who prefer rollerblades) and a blank pictograph with the same three labels, the student will draw the correct number of icons in each row of the pictograph.
- Given a completed table with three rows (number of macaws in the wild, number of cheetahs in the wild, number of black rhinos in the wild) and a blank pictograph, the student will label the rows in the pictograph and draw the correct number of icons in each row.
- Given a completed table with three rows (number of macaws in the wild, number of macaws in zoos, number of macaws kept as pets in the U.S.) and an unlabeled pictograph with three rows that represent the numbers in the table, the student will correctly label each row of the pictograph.

Content Standard: DATA ANALYSIS AND PROBABILITY

Standard: *The student will understand and apply basic statistical and probability concepts in order to organize and analyze data and to make predictions and conjectures.*

Alternate Learning Expectation (ALE): DAP.2 *The student will apply basic concepts of probability.*

Alternate Performance Indicator (API): DAP2.5 *Determine if an event is likely or not likely using simple experiments (e.g. coin toss)*

Sample Activities:

- The student and three peers will take turns rolling a die, spinning a spinner, and reaching blindly into a container to select a colored marble (replaced after being drawn) a dozen times. They will then color the appropriate square in a bar graph for each pick. The teacher will ask guiding questions, such as, "Did some results happen more often or less often than others? Do you think some results are more likely to happen than others?" The student and peers will repeat the experiment, this time without replacing the marble, and compare the results.

- The student and three peers will spill out the contents of cups containing five two-colored counters and record the number of red sides and the number of yellow sides. They will perform the experiment twenty times, examine their data, and then discuss questions such as "Does getting four red sides happen more often than two red sides?" They will discuss their reasoning.

- The student and four peers will each be given a spinner with four numbered sections. Working in pairs, the students will spin their spinners simultaneously, and together they record whether they have a match. After doing this several times, they predict how many times they would have a match in 20 spins. Then they compare their prediction with what happens when they actually spin the spinners 20 times. They will repeat the activity with a different number of equal sections marked on their spinners.

*These activities were taken from the New Jersey Mathematics Curriculum framework, copyright 1996 by the New Jersey Mathematics Coalition, web address http://dimacs.rutgers.edu/nj_math_coalition/framework/ch12/ch12_k-02.html.

Content Standard: DATA ANALYSIS AND PROBABILITY

Standard: *The student will understand and apply basic statistical and probability concepts in order to organize and analyze data and to make predictions and conjectures.*

Alternate Learning Expectation (ALE): DAP.2 *The student will apply basic concepts of probability.*

Alternate Performance Indicator (API): DAP2.6 *Reproduce and interpret data in simple circle graphs and/or line graphs*

Sample Activities:

- The student will participate in a whole-class activity in which each student is asked his or her favorite flavor of ice cream (strawberry, chocolate, vanilla, or other) and given a paper cutout of a person to represent his or her choice (pink for strawberry, brown for chocolate, white for vanilla, and yellow for other). The teacher will draw a circle on the board large enough for all the paper cutouts to fit around. The students who chose strawberry will use tape to attach their cutouts around one section of the circle, the students who chose chocolate will attach their cutouts around another section of the circle, and so on. Once all of the cutouts have been attached, they should be evenly spaced around the circle and grouped by color. The teacher will draw lines to create the wedges of the pie graph, representing the number of students who chose each flavor. The student will then participate in a class discussion of what each wedge represents.
- Given two line graphs representing a hypothetical student's grades, one of which shows improved performance (line going up) and one of which shows a decrease in performance (line going down), the student will correctly identify which is which.

Content Standard: DATA ANALYSIS AND PROBABILITY

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Alternate Learning Expectation (ALE): DAP.2 *The student will apply basic concepts of probability.*

Alternate Performance Indicator (API): DAP2.7 *Interpret data in simple bar and line graphs to answer questions and solve real world problems*

Sample Activities:

- Given a bar graph comparing the number of rolls of wrapping paper sold during previous years as a school fundraiser, the student will determine which year was the most successful and brainstorm ways to make the current year's fundraiser more successful.
- During a group project in Agriculture I class, the student will use a simple line graph (showing a decline in the number of live foals born in the past three years) and simple bar graphs (one showing the number of live births as related to mare's body condition, one showing the number of live births as related to the quality of the mare's feed, and one showing the number of live births as related to the amount of turnout given to the mare) to help devise a plan of action for the care and feeding of pregnant mares. The teacher and peers will use guiding questions and prompting statements as needed to help the student interpret the information provided.

Content Standard: DATA ANALYSIS AND PROBABILITY

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Alternate Learning Expectation (ALE): DAP.2 *The student will apply basic concepts of probability.*

Alternate Performance Indicator (API): DAP2.8 *Interpret and/or construct tables using tally marks*

Sample Activities:

- The student will use tally marks to keep score during a game of "Trivial Pursuit for Kids."
- Given a blank table with two columns, one labeled "boys" and one labeled "girls," the student will complete the table by appropriately making one tally mark for each boy in his or her general education math class and one tally mark for each girl in the class.
- Given three columns on the whiteboard, each labeled with a game (kickball, Candyland, and Twister), the student will ask each of his or her classmates to name one of the three games as a favorite and will record their choices using tally marks. The student will then count the tally marks in each column and announce how many students chose each game.

Content Standard: DATA ANALYSIS AND PROBABILITY

Standard: *The student will understand and apply basic statistical and probability concepts in order to organize and analyze data and to make predictions and conjectures.*

Alternate Learning Expectation (ALE): DAP.2 *The student will apply basic concepts of probability.*

Alternate Performance Indicator (API): DAP2.9 *Write questions and gather data to answer questions (e.g. students' favorite color of apple)*

Sample Activities:

- With help from the teacher, the student will come up with a question to ask his or her classmates. The student will then conduct the survey, record the answers, and chart the results using a simple pictograph or bar graph, whichever the student chooses.
- With help from a peer, the student will come up with a list of five questions to ask his or her peers. The teacher will make 20 copies of the list, and the student will give the list to 20 schoolmates who agree to answer the questions and return the survey. The peer will help the student interpret the data, look for patterns, and graph the results using simple graphs.

Content Standard: DATA ANALYSIS AND PROBABILITY

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Alternate Learning Expectation (ALE): DAP.2 *The student will apply basic concepts of probability.*

Alternate Performance Indicator (API): DAP2.10 *Determine all possible outcome of a simple experiment (e.g. number cubes, tossing coins, spinner)*

Sample Activities:

- Given two quarters, the student will use a pencil and paper to predict all the possible outcomes when both coins are tossed at the same time (e.g., two heads, two tails, first coin heads and second head tails, etc.).
- Given a pair of six-sided number cubes, the student will use a pencil and paper to chart all the possible outcomes when both cubes are rolled at the same time. A peer will provide help as needed. Once the chart is complete, the student will then roll the dice 100 times and compare the results to the chart to show that, no matter how many times the dice are rolled, there will never be a combination that is not represented on the chart.

Content Standard: DATA ANALYSIS AND PROBABILITY

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Alternate Learning Expectation (ALE): DAP.2 *The student will apply basic concepts of probability.*

Alternate Performance Indicator (API): DAP2.11 *Find the average using a calculator*

Sample Activities:

- Given a list of grades for a hypothetical student, the student will use a calculator to find the hypothetical student's average.
- During a class bowling trip, the student will record the scores of all games played. After the class returns to school, the student will use a calculator to determine each student's average and the average of the class as a whole.